

REMARKS

Claims 1-5, 7, 8, and 10-32 are pending for the Examiner's review and consideration. Claims 1, 3, 7, 11-14, 18-19, and 23-24 have been amended and are supported in the originally filed specification and claims. Also, new claims 25-32 have been added. Claims 6 and 9 have been cancelled without prejudice.

The specification has been amended to correct the occurrences of numeral 30 to appear as numeral 28. Two typographical errors have also been corrected in the paragraphs on lines 12 and 24 of page 9. Specifically, the line 12 paragraph correction regarding the stiffness being increased most preferably about the substantially longitudinal axis is supported, for example, in the paragraph starting at page 3, line 8. Also, it is clear that the upper surface of the upper frame member of the embodiment described is generally horizontal in the line 24 paragraph, based on the drawings and the description in the same paragraph of the rear of the forward portion of the upper side struts also being generally horizontal. The addition in the page 9, line 20 paragraph regarding the struts being in compression is fully supported by the original drawings and disclosure, and one of ordinary skill in the art would understand that the loading of the frames at the disclosed points in the embodiments shown would result in the upper side struts being in compression, and the stiffening by the upper frame position is disclosed and shown in the original filing.

In the Office Action, the disclosure was objected to for lacking antecedent basis for elements in claims 3, 5, 7, 11-12, 18, and 23-24. This objection is understood to be for antecedent basis in the claims themselves, since the terms referred to have many occurrences of antecedent basis in the disclosure. The objection is thus addressed in this manner.

To address this objection, claim 3 recites a framework stiffness, which, although inherent, has positively been added to the claim. Similarly, claims 12 and 18 have been amended to positively recite that the frame and first frame portion a stiffness or torsional stiffness, which is also considered unnecessary but has been done to facilitate the prosecution.

"Interior cavity" was objected to in claim 5, but no amendment is deemed necessary since this cavity is recited in claim 1, from which claim 5 depends. Claim 7 has been amended to recite the "interior cavity" and claim 24 has been similarly amended. Claim 11 now recites the "vehicle", instead of a "scooter". In claim 12, "second frame

"member" has been changed to "second frame portion", and this change has been made in other claims as well. Antecedent basis is now present in claim 23, and similar amendments have been made to claim 19.

Claims 9-11 and 18 were rejected under 35 U.S.C. § 112 as being indefinite. Claim 18 has a typographical amendment to clarify the claim. Claim 9 has been canceled without prejudice, but the § 112 issues will be addressed if this claim is prosecuted in the future, such as in a continuation filing.

Claims 1-13, 15-19, and 21-24 were rejected under 35 U.S.C. § 102(b) as being obvious over Yashima et al. (U.S. Patent No. 4,700,795). Also, claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yashima alone.

Claim 1 is directed to a vehicle frame that includes first and second frame portions. The first portion has a plurality of struts associated with each other to form a first framework, and the second frame portion is separably associable with the first frame portion in an association in which it significantly increases the stiffness of the first frame portion. The associated frame portions are configured to support a rider sitting on the vehicle frame, and these portions cooperatively define and substantially enclose an interior cavity between the portions. The interior cavity is dimensioned to house a component of the propulsion system propelling the vehicle. The frame portions are also configured to be supportedly attached to the vehicle wheels. Claim 23 defines an electric vehicle with a vehicle frame that comprises upper and lower frame portions, the upper frame portion having a skin member associable with the first frame portion to significantly increase the stiffness thereof. A seat is mounted on the upper frame portion, and an electrical energy source is housed within the interior cavity. An electric motor is connected and powered by the energy source to propel the vehicle.

The Office Action includes the argument that Yashima discloses a scooter frame with a first frame portion (80-85/88/92/93), and a second frame portion (86-91/94/95). The argument next states that skin members are shown in phantom in Fig. 6 for closing at least portions of openings defined between the struts, and that there are unidentified battery trays for batteries 30. It is also argued that the second frame portion increases the stiffness of the first frame portion.

The portions of the Yashima frame as defined by the Examiner, however, do not meet the recitations of claims 1 or 23. For example, the first and second frame portions of the claims cooperatively define and substantially enclose an interior cavity between the frame portions. On the other hand, the portions of Yashima do not cooperatively define any interior cavity, since one of these frame portions is merely located where the other ends: the "second frame portion" is attached at the very rear of the "first frame portion," as defined by the Examiner in Yashima, and just continues rearward. These two frame portions do not cooperatively define or enclose any cavity.

Additionally, there is no disclosure that one of these Yashima frame portions stiffens the other, since one is merely attached extending up from the rear-most part of the other frame portion. In fact, the attachment of the two frame portions would decrease the stiffness of the overall frame, especially in torsion, since the "second frame portion" provides a much longer arm over which to apply torsional or other loads onto the "first frame portion" than would be possible if the "second frame portion" were not present. Moreover, the two frame portions as defined by the Examiner are welded together, and are not separable as defined in claim 1.

With respect to the definition in claim 23 of the electric motor and electrical energy source which are connected for propelling the vehicle, this is very different than the disclosure of Yashima. Yashima uses an internal-combustion piston engine to propel the vehicle, and the batteries 30 are merely employed to operate a starter, not to propel the vehicle. (*See, e.g.*, Yashima 7:8-13.) There is a significant difference in the volume and bulk of an electrical energy source that is large enough to provide the energy to propel a vehicle, compared to a small battery as disclosed in Yashima that only needs to turn over a small piston engine for starting. The volume and size that would be required to have such an electrical energy source, whether it be batteries, a fuel cell, or another source or combination thereof that is sufficiently large to power an electric motor to propel the vehicle, is much larger than the tiny batteries disclosed in Yashima, as evident from the disclosure of the present application.

Furthermore, claims 25 and 28 define minimum preferred volumes of the interior cavity to house the requisite component of the propulsion system. These volumes, namely 1000 in³ and 2500 in³, respectively, are much larger than anything envisioned in

Yashima, and there is no suggestion or motivation to provide such large spaces for housing batteries in the Yashima scooter. Furthermore, claim 26 defines that the interior cavity has a height of at least about 15 inches and width of at least about 6 inches, and claim 27 further defines that the interior cavity has a length of at least about 25 inches. These sizes are much larger than anything disclosed or suggested in Yashima, which requires a very small and shallow space to house its starting batteries.

Claim 29 further defines that the first and second frame portions cooperative to substantially enclose at least top, bottom, front, and lateral sides of the interior cavity. There is no such cavity in Yashima enclosed by two frame portions on at least top, bottom, front, and lateral sides thereof.

Claim 2 recites at least one skin member that is structurally associated with the struts for closing at least portions of the openings defined therebetween, and claim 3 defines that the skin member significantly increases the stiffness of the framework of the first frame portion. Furthermore, claim 5 defines a battery tray that is associated with the first framework to significantly stiffen it. Claim 12 defines that the second frame portion includes a skin member that significantly contributes to the stiffness of the frame.

The recitation of the skin(s) as being structurally associated to increase the stiffness of the framework is very significantly different than the portion that is shown in phantom lines in Fig. 6 of Yashima. It is well known in the art that fairings and other non-structural skins can be attached to an underlying structural frame, but these are not used for stiffening the underlying frame. This is the case in Yashima, in which there is no disclosure of providing any skins to close openings between a framework and to additionally stiffen the framework. These claims provide a surprising advantage over the prior art in that a strong basic framework of struts can be provided, while additionally taking advantage of an increased stiffening by using a semi-monocoque construction.

There is no teaching or suggestion in Yashima that any of the skin members close openings between any struts, as defined in claim 2, and the outer non-structural skins that are shown in phantom in Fig. 6 of Yashima are not necessarily mounted to close such openings, but instead are provided to together surround and hide the frame. The claimed association of the skin members with the framework to close the openings is especially advantageous when the skin members are structural and increase the frame stiffness since

closing the openings provides efficient and robust load pads to act as a webbing between the struts. Claim 31, for example, defines that the skins close off at least about 75% of the openings defined between the struts, which is not accomplished by any structural member in the Yashima patent.

The additional stiffness provided by the claimed construction is significant and non-obvious. In fact, as explained starting at the bottom of page 8 in the Application, the stiffness of the frame has been extensively analyzed by the inventors and has been found to provide very significant increases in stiffness compared to traditional construction and compared to the independent stiffness of each frame position. The increase in stiffness is specifically defined in claim 18, which recites that the stiffness of the first frame portion is increased by a factor between about 1.2 and 10 by the association with the second frame position, while on the other hand, there is absolutely no disclosure or suggestion that any of the disclosed frame in Yashima can be separable and provide anywhere near this increase in stiffness while cooperatively defining an interior cavity while cooperatively defining an interior cavity.

The Examiner argued that it would have been obvious at the time of the invention to include the invention of claim 18 to ensure that the frame portions have the required structural characteristics for a particular application. The manner in which the stiffness is increased in the claimed invention, however, is not suggested by Yashima. The traditional method of frame construction, which is disclosed in Yashima, provides all the necessary structural characteristics in the underlying frame, and there are no frame portions, separable or not, that define and enclose an interior cavity and at the same time provide the increased stiffness. It is not obvious to provide such a separable frame portion to enclose an interior cavity as defined in claim 18 based on the disclosure of Yashima.

Additionally, as evident from the construction of the disclosed embodiments of the inventive frame, when the frame is mounted on the wheels, such as shown in Fig. 13, the struts 32 that run generally longitudinally near the upper side of the bottom frame portion and which are spaced from each other substantially on opposite sides of the interior cavity are in compression. In the embodiment shown, there is no crosspiece between them, so as to maintain the opening to the interior cavity at this height as open as possible to access and load the items that will be housed therein. Since these struts are in compression, one of ordinary

skill in the art would understand that the struts would be prone to buckling in a horizontal direction. The structural upper frame portion, which defines and encloses the top part of the interior cavity of the embodiments, increases the stiffness of the frame also at the level of these longitudinal struts, preventing them from buckling, and thus significantly increasing the stiffness of the frame without requiring the cavity to be blocked by a part of the lower frame portion.

Claim 32 defines that the first frame portion has longitudinal struts that are spaced from each other substantially on opposite sides of the interior cavity, and are in compression due to the support of the first frame portion on the wheels. This claim defines that the second frame portion extends over and across the interior cavity and is structurally associated with these longitudinal struts to substantially increase the stiffness thereof. This construction is not disclosed in any of the references of record, and the surprising advantage described above is also not suggested in Yashima, since there is no large cavity with no struts that are in compression, or any second frame portion enclosing the cavity that can increase the compressed struts' stiffness, to increase their resistance to buckling.

Consequently, claims 1-3, 5, 12, 18, 23, 25-29, and 31-32, on their own merits, are neither anticipated nor obvious over the references of record.

Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yashima in view of Stevenson et al. (U.S. Patent No. 6,047,786), and Ono (U.S. Patent No. 5,207,288). Claim 14 defines that the struts are made of aluminum or an aluminum alloy, and that the skin member of the second frame portion is made of a composite, fiber-reinforced material. As explained above, the selection of the material and configuration for the second frame portion can provide the surprising advantages of significantly increasing the torsional stiffness or resistance to buckling of the first frame portion, which is not disclosed or suggested in Yashima. A composite, fiber-reinforced material is especially advantageous for such a second frame portion skin in that it effectively will carry loads through that material, better than nonstructural plastics, for example.

Additionally, there is no motivation to combine Yashima with either or both Stevenson and Ono since the types of construction of the frames of Stevenson and Ono are significantly different than the type of frame provided in Yashima. The Stevenson and Ono frames are basically monocoque frames, while the Yashima frame is the standard welded tube

and strut construction. One of ordinary skill in the art would not have found motivation to use the skins of Stevenson or Ono since the Yashima frame is structurally complete just with its tubes and struts, while the other references use single-piece molded skins. There is also no suggestion or motivation to attach the skins of Stevenson and Ono to Yashima, since it is unclear how any of the skins of Stevenson and Ono could be made to fit to the tubes of Yashima in the first place. Stevenson and Ono are not readily modifiable in this manner. Consequently, even if the teachings of these three references were somehow combined, the product would not result in the claimed frame with a framework of struts that along with a separable second frame portion defines an interior cavity to house propulsion components, with stiffening skin members additionally provided made out of the recited materials. Thus, claim 14 is also patentably distinct over the references.

Claim 30 further recites that both the struts and skin members of the first frame portion are made of aluminum or an alloy thereof, and are welded together. This is also not taught or suggested in any of the references, and provides a particularly advantageous semi-monocoque construction, with structural materials that are positively coupled by welding to increase the frame stiffness.

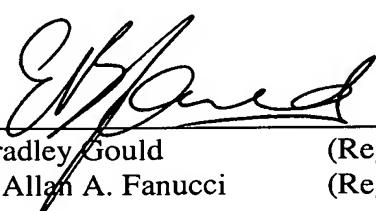
It is believed that the entire application is presently in condition for allowance. Should any issues remain, a personal or telephonic interview is respectfully requested to discuss the same in order to expedite the allowance of the application.

Respectfully submitted,

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